

REMARKS

Initially, Applicants object to the reopening of prosecution in this application. The Examiner had maintained the prior rejections for several years despite Applicants' attempts to advance prosecution by amending the claims and interviewing with the Examiner. Nevertheless, the Examiner has now -- after Applicants undertook the time and incurred the expense of filing an appeal brief -- decided to reconsider the rejections of record. Upon reopening prosecution, the Examiner has now applied a completely new set of references to reject Applicants' claims. As explained below, the new references do not provide any better basis for rejecting Applicants' claims than the references previously relied upon.

In the non-final Office Action, the Examiner rejected claims 1, 3-10, 13, 15, 16, 19, 23, 24, 27, 30, 31, and 34-39 under 35 U.S.C. § 103(a) as unpatentable over MILOUSHEV et al. (U.S. Patent Application Publication No. 2002/0120763) in view of ULRICH et al. (U.S. Patent Application Publication No. 2002/0191311) and further in view of MAHALINGAM et al. (U.S. Patent Application Publication No. 2003/0115439); rejected claims 11, 21, and 22 under 35 U.S.C. § 103(a) as unpatentable over MILOUSHEV et al. in view of ULRICH et al. and MAHALINGAM et al. and further in view of BURNETT (U.S. Patent No. 5,644,751); rejected claim 20 under 35 U.S.C. § 103(a) as unpatentable over MILOUSHEV et al. in view of ULRICH et al. and MAHALINGAM et al. and further in view of DERAN (U.S. Patent No. 5,283,894); and rejected claims 25, 26, 28, 29, 32, and 33 under 35 U.S.C. § 103(a) as unpatentable over MILOUSHEV et al. in view of ULRICH et al. and MAHALINGAM et al. and further in view of LEDAIN et al. (U.S. Patent No. 6,021,408). Applicants respectfully traverse the Examiner's rejections.

By this Amendment, Applicants amend claims 1, 3-8, 10, 13, 15, 16, 21, 23, 25, 26, 30, and 34-37 to improve form. Claims 1, 3-11, 13, 15, 16, and 19-39 remain pending.

*REJECTION UNDER 35 U.S.C. § 103 BASED ON
MILOUSHEV ET AL., ULRICH ET AL. AND MAHALINGAM ET AL.*

In paragraph 4 of the Office Action, the Examiner rejected claims 1, 3-11, 13, 15, 16, 19-24, 27, 30, 31, and 34-39 under 35 U.S.C. § 103(a) as allegedly unpatentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. Applicants traverse the rejection.

Independent claim 1 is directed to a file system that comprises a plurality of servers to store file data as chunks; and a master, connected to the servers, to store namespace data that includes file identifiers for files for which the file data is stored as chunks, store mapping data that maps the file identifiers to the chunks to which the file identifiers correspond, store an operation log that includes a historical record of changes that have occurred to at least one of the namespace data or the mapping data, and store location data that identifies which of the servers stores which of the chunks, where the master is to communicate with the servers at startup of the master to identify the chunks stored by the servers, and record, only in a non-persistent manner, information regarding the chunks, which have been identified as being stored by each of the servers, as the location data.

MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, do not disclose or suggest one or more of the features recited in claim 1. For example, MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. do not disclose or suggest a master that is to, among other things, store an operation log that includes a historical record of changes that have occurred to at least one of namespace data, which includes file identifiers for files for which the file data is stored as chunks, or mapping data, which maps

the file identifiers to the chunks to which the file identifiers correspond, as recited in claim 1.

The Examiner admitted that MILOUSHEV et al. and ULRICH et al. do not disclose or suggest an operation log, and alleged that MAHALINGAM et al. discloses an operation log that includes a record of changes to at least one of namespace data or mapping data, and cited paragraph 0042 and Figure 2 of MAHALINGAM et al. for support (Office Action, page 5). Without acquiescing in the Examiner's allegation, Applicants submit that MAHALINGAM et al. does not disclose or suggest a master that is to, among other things, store an operation log that includes a historical record of changes that have occurred to at least one of namespace data, which includes file identifiers for files for which the file data is stored as chunks, or mapping data, which maps the file identifiers to the chunks to which the file identifiers correspond, as recited in claim 1.

At paragraph 0042, MAHALINGAM et al. discloses:

For all recovery scenarios in the non-aggressive-update implementation of the object migration process, the recovery process performs phases 1 through 3 until the migration is complete, even as the system continues to service other requests. Because initiation and completion of the namespace update process (phase 4) is logged to the intention log file, the recovery process can be rescheduled even when the hosting partition server fails.

In this section, MAHALINGAM et al. discloses that initiation and completion of a namespace update process is logged in an intention file. MAHALINGAM et al. discloses that at the beginning and end of each phase of an object migration, an entry is written to the intention log file (para. 0035). When the migration process is complete, the log entries, associated with the migration, are removed from the intention log file (para. 0035). Thus, even assuming, for the sake of argument, that the intention log file can reasonably correspond to an operation log (a point that Applicants do not concede), the intention log file does not include a historical record

of changes that have occurred to at least one of namespace data or mapping data. Rather, MAHALINGAM et al. clearly discloses that the entries in the intention log file are removed after the migration process ends. Thus, MAHALINGAM et al. does not disclose or suggest a master that is to, among other things, store an operation log that includes a historical record of changes that have occurred to at least one of namespace data, which includes file identifiers for files for which the file data is stored as chunks, or mapping data, which maps the file identifiers to the chunks to which the file identifiers correspond, as recited in claim 1.

Further, even assuming for the sake of argument, that MAHALINGAM et al. can reasonably be interpreted as disclosing an operation log that includes a historical record of changes that have occurred to at least one of namespace data or mapping data (a point that Applicants do not concede for at least the reasons given above), Applicants submit that the Examiner has failed to establish a prima facie case of obviousness.

For example, the Examiner alleged:

It would have been obvious to one of ordinary skill in the art at the time of the invention to store the information of Mahalingam in the log of Ulrich. One would have been motivated to do so in order to increase access speeds of locating data through maintenance of location data.

(Office Action, page 5). Applicants submit that the Examiner's reason for modifying the disclosure of ULRICH et al. lacks merit. Further, Applicants submit that the Examiner did not explain why it would have been obvious to modify the primary reference (MILOUSHEV et al.) to include the alleged feature of MAHALINGAM et al. Thus, the Examiner has not established a prima facie case of obviousness with regard to claim 1.

Also, Applicants submit that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the modification. Such conclusory statements have been repeatedly held

to be insufficient for establishing a prima facie case of obviousness. In this respect, Applicants rely upon KSR International Co. v. Teleflex Inc., 550 U.S. 398 (April 30, 2007) (citing In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006)), where it was held that rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In this case, the Examiner provided no such articulated reasoning with a rational underpinning.

Furthermore, the Examiner has not explained how including an operation log that includes a record of changes to the namespace data and/or the mapping data in the ULRICH et al. system would "increase access speeds of locating data through maintenance of location data," as alleged by the Examiner. In fact, this does not even seem to be a reasonable benefit of the modification. Therefore, the Examiner's allegation falls short of establishing a prima facie case of obviousness with regard to claim 1.

MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, also do not disclose or suggest a master that is to, among other things, communicate with the servers at startup of the master to identify the chunks stored by the servers and record, in only a non-persistent manner, information regarding the chunks, which have been identified as being stored by each of the servers, as the location data, as further recited in claim 1.

The Examiner admitted that MILOUSHEV et al. does not disclose a master that is configured to communicate with the servers at startup of the master to identify the chunks stored by the servers, and record, in a non-persistent manner, information regarding the chunks stored

by each of the servers as location data (Office Action, page 4). The Examiner alleged that ULRICH et al. discloses these features and cited paragraph 0196 of ULRICH et al. for support (Office Action, page 4). Without acquiescing in the Examiner's allegation, Applicants submit that ULRICH et al. does not disclose or suggest a master that is to, among other things, communicate with the servers at startup of the master to identify the chunks stored by the servers and record, in only a non-persistent manner, information regarding the chunks, which have been identified as being stored by each of the servers, as the location data, as recited in claim 1.

At paragraph 0196, ULRICH et al. discloses:

In one embodiment, in order to enhance both the security of the metadata and efficient access to the metadata, each server node 150, 151 stores a copy of the Filename Table 310, the G-node Table 330, the Gnid Table 340, and the Gee Table 320 in both non-volatile memory (for security) and in volatile memory (for fast access). Changes made to the volatile versions of the metadata structures 310, 320, 330, 340 are periodically sent to the non-volatile versions for update.

In this section, ULRICH et al. discloses storing a copy of several tables in both non-volatile memory and in volatile memory. ULRICH et al. does not disclose suggest, in this section or elsewhere, that these tables are populated with information obtained by communicating with servers at startup to identify the chunks stored by the servers. Even assuming, for the sake of argument, that ULRICH et al. discloses populating these tables with information obtained by communicating with servers at startup to identify the chunks stored by the servers (a point that Applicants do not concede), ULRICH et al. does not disclose or suggest recording information regarding the chunks, which have been identified as being stored by the servers, in only a non-persistent manner. Rather ULRICH et al. discloses storing the information of the tables in volatile and non-volatile memory (para. 0192). Thus, ULRICH et al. does not disclose or suggest a master that is to, among other things, communicate with the servers at startup of the

master to identify the chunks stored by the servers and record, in only a non-persistent manner, information regarding the chunks, which have been identified as being stored by each of the servers, as the location data, as recited in claim 1.

Further, even assuming for the sake of argument, that ULRICH et al. can reasonably be interpreted as disclosing a master that is to, among other things, communicate with the servers at startup of the master to identify the chunks stored by the servers and record, in only a non-persistent manner, information regarding the chunks, which have been identified as being stored by each of the servers, as the location data (a point that Applicants do not concede for at least the reasons given above), Applicants submit that the Examiner has failed to establish a prima facie case of obviousness.

For example, the Examiner alleged:

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the metadata disclosed by Ulrich, which stored in a non-persistent manner as additional metadata collected by the files system of Miloushev. One would have been motivated to do so since Miloushev stripes data across disks, and maintaining metadata of the stripes increase efficiency of the system.

(Office Action, page 5). Applicants submit that the Examiner's reason for modifying the disclosure of MILOUSHEV et al. lacks merit.

Applicants submit that the Examiner's allegation is merely a conclusory statement of an alleged benefit of the modification. Such conclusory statements have been repeatedly held to be insufficient for establishing a prima facie case of obviousness. In this respect, Applicants rely upon KSR International Co. v. Teleflex Inc. (citing In re Kahn), where it was held that rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of

obviousness. In this case, the Examiner provided no such articulated reasoning with a rational underpinning.

Furthermore, the Examiner's reason does not explain why it would have been obvious to record information regarding where chunks are stored in a non-persistent manner. Rather, the Examiner has provided a reason why it would have been obvious to use the metadata collected by ULRICH et al. in the MILOUSHEV et al. system. This reason falls short of establishing a prima facie case of obviousness with regard to claim 1.

Also, the Examiner has not explained why storing metadata, in a non-persistent manner, in the MILOUSHEV et al. system would increase the efficiency of the MILOUSHEV et al. system. Without such an explanation, the Examiner's reason falls short of establishing a prima facie case of obviousness with regard to claim 1.

The multiple features expressly set forth in claim 1 allow for unique combinations of functionality and capability not disclosed or suggested by the MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination.

For at least these reasons, Applicants submit that claim 1 is patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination. Claims 3-10, 19, 23, and 24 depend from claim 1 and are, therefore, patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. for at least the reasons given with regard to claim 1. Claims 3-10, 19, 23, and 24 are also patentable for reasons of their own.

Initially, Applicants note that the Examiner relied upon sections of ULRICH et al. and/or MAHALINGAM et al. for disclosing some features of the dependent claims. The Examiner did

not provide, however, a reason for combining these alleged features. Thus, the Examiner did not establish a prima facie case of obviousness with regard to these dependent claims.

Dependent claim 4 recites that the master is to identify one or more of the servers to store the new chunks based on failure correlation properties associated with the servers and at least one of utilization of the servers, prior chunk distribution involving the servers, or network topology, and place the new chunks at the identified one or more servers.

MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, do not disclose one or more of the features of claim 4. For example, MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. do not disclose or suggest a master that is to identify one or more of the servers to store the new chunks based on failure correlation properties associated with the servers and at least one of utilization of the servers, prior chunk distribution involving the servers, or network topology, as recited in claim 4.

The Examiner alleged that MILOUSHEV et al. discloses using storing capacity of file servers and their relative load to identify one or more servers to store new chunks (Office Action, page 6). The Examiner alleged that ULRICH et al. discloses using server utilization statistics to identify one or more servers to store new chunks (Office Action, page 6). Without acquiescing in the Examiner's allegations, Applicants submit that neither MILOUSHEV et al. nor ULRICH et al. discloses or suggests using failure correlation properties associated with the servers to identify one or more servers to store new chunks. MAHALINGAM et al. also does not disclose or suggest using failure correlation properties associated with servers to identify one or more servers to store new chunks. Thus, MILOUSHEV et al., ULRICH et al., and

MAHALINGAM et al., whether taken alone or in any reasonable combination, do not disclose or suggest a master that is to identify one or more of the servers to store the new chunks based on failure correlation properties associated with the servers and at least one of utilization of the servers, prior chunk distribution involving the servers, or network topology, as recited in claim 4.

For at least these additional reasons, Applicants submit that claim 4 is patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al.

Dependent claim 23 recites that the master is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers. MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, do not disclose or suggest this feature.

The Examiner alleged that ULRICH et al. discloses this feature and cited paragraphs 0113, 0131, and 0183-0187, of ULRICH et al. for support (Office Action, page 15). Applicants submit that the disclosure of ULRICH et al. provides no support for the Examiner's allegation.

At paragraph 0113, ULRICH et al. discloses that the DFSS provides inter-server communication to maintain synchronization of the file system metadata. Inter-server communication to maintain synchronization of file system metadata does not reasonably correspond to a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers. Thus, this section of ULRICH et al. does not disclose or suggest a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers, as recited in claim 23.

At paragraph 0131, ULRICH et al. discloses storing a device map and periodically querying the network for an updated device map. Periodically querying a network for an updated device map does not reasonably correspond to a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers. Thus, this section of ULRICH et al. does not disclose or suggest a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers, as recited in claim 23.

At paragraphs 0183-0187, ULRICH et al. discloses that a cluster maintains metadata about the files stored on its disk arrays, including a filename table, a G-node table, and a Gee table. Storing file metadata in tables does not reasonably correspond to a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers. Thus, this section of ULRICH et al. does not disclose or suggest a master that is to update the location data by periodically instructing the servers to provide information regarding the chunks stored by the servers, as recited in claim 23.

For at least these additional reasons, Applicants submit that claim 23 is patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination.

Dependent claim 24 recites that the operation log includes a logical timeline that defines an order for concurrent operations. MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, do not disclose or suggest this feature.

The Examiner alleged that MAHALINGAM et al. discloses this feature and cited

paragraph 0035 of MAHALINGAM et al. for support (Office Action, page 15). Applicants submit that the disclosure of MAHALINGAM et al. provides no support for the Examiner's allegation.

At paragraph 0035, MAHALINGAM et al. discloses that at the beginning and end of each phase of an object migration, an entry is written to the intention log file. When the migration process is complete, the log entries, associated with the migration, are removed from the intention log file. Nowhere in this section, or elsewhere, does MAHALINGAM et al. even mention defining an order for concurrent operations. Thus, MAHALINGAM et al. does not disclose or suggest an operation log includes a logical timeline that defines an order for concurrent operations, as recited in claim 24.

For at least these additional reasons, Applicants submit that claim 24 is patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination.

Independent claims 13, 15, 16, and 30 recite features similar to features identified above with regard to claim 1. Claims 13, 15, 16, and 30 are, therefore, patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al., whether taken alone or in any reasonable combination, for at least reasons similar to reasons given with regard to claim 1. Claims 27 and 38 depend from claim 13 and are, therefore, patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. for at least the reasons given with regard to claim 13. Claims 34 and 35 depend from claim 15 and are, therefore, patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. for at least the reasons given with regard to claim 15. Claims 36 and 37 depend from claim 16 and are, therefore, patentable over MILOUSHEV et al., ULRICH et al.,

and MAHALINGAM et al. for at least the reasons given with regard to claim 16. Claims 31 and 39 depend from claim 30 and are, therefore, patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. for at least the reasons given with regard to claim 31. Claims 27 and 31 also recite a feature similar to a feature recited in claim 24. Therefore, claims 27 and 31 are also patentable over MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. for at least reasons similar to the reasons given with regard to claim 24.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 3-11, 13, 15, 16, 19-24, 27, 30, 31, and 34-39 under 35 U.S.C. § 103 based on MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al.

*REJECTION UNDER 35 U.S.C. § 103 BASED ON
MILOUSHEV ET AL., ULRICH ET AL., MAHALINGAM ET AL., AND BURNETT*

In paragraph 5 of the Office Action, the Examiner rejected claims 11, 21, and 22 under 35 U.S.C. § 103(a) as allegedly unpatentable over MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and BURNETT. Applicants traverse the rejection.

Claims 11, 21, and 22 depend from claim 1. Without acquiescing in the Examiner's rejection with regard to claims 11, 21, and 22, Applicants respectfully submit that the disclosure of BURNETT does not cure the deficiencies in the disclosures of MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. identified above with regard to claim 1. Therefore, claims 11, 21, and 22 are patentable over MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and BURNETT, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 11, 21, and 22 under 35 U.S.C. § 103 based on MILOUSHEV et al., ULRICH

et al., MAHALINGAM et al., and BURNETT.

*REJECTION UNDER 35 U.S.C. § 103 BASED ON
MILOUSHEV ET AL., ULRICH ET AL., MAHALINGAM ET AL., AND DERAN*

In paragraph 6 of the Office Action, the Examiner rejected claim 20 under 35 U.S.C. § 103(a) as allegedly unpatentable over MILOUSHEV et al., ULRICH et al. MAHALINGAM et al. and further in view of DERAN. Applicants traverse the rejection.

Claim 20 depends from claim 1. Without acquiescing in the Examiner's rejection with regard to claim 20, Applicants respectfully submit that the disclosure of DERAN does not cure the deficiencies in the disclosures of MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. identified above with regard to claim 1. Therefore, claim 20 is patentable over MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and DERAN, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 20 under 35 U.S.C. § 103 based on MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and DERAN.

*REJECTION UNDER 35 U.S.C. § 103 BASED ON
MILOUSHEV ET AL., ULRICH ET AL., MAHALINGAM ET AL., AND LEDAIN ET AL.*

In paragraph 7 of the Office Action, the Examiner rejected claims 25, 26, 28, 29, 32, and 33 under 35 U.S.C. § 103(a) as allegedly unpatentable over MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and LEDAIN et al. Applicants traverse the rejection.

Claims 25 and 26 depend from claim 1; claims 28 and 29 depend from claim 13; and claims 32 and 33 depend from claim 30. Without acquiescing in the Examiner's rejection with regard to claims 25, 26, 28, 29, 32, and 33, Applicants respectfully submit that the disclosure of

LEDAIN et al. does not cure the deficiencies in the disclosures of MILOUSHEV et al., ULRICH et al., and MAHALINGAM et al. identified above with regard to claims 1, 13, and 30.

Therefore, claims 25, 26, 28, 29, 32, and 33 are patentable over MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and LEDAIN et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 20 under 35 U.S.C. § 103 based on MILOUSHEV et al., ULRICH et al., MAHALINGAM et al., and LEDAIN et al.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request the Examiner's reconsideration of the application and the timely allowance of the pending claims.

As Applicants' remarks with respect to the Examiner's rejections are sufficient to overcome these rejections, Applicants' silence as to certain assertions by the Examiner in the Office Action or certain requirements that may be applicable to such assertions (e.g., whether a reference constitutes prior art, reasons for modifying a reference and/or combining references, assertions regarding dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or such requirements have been met, and Applicants reserve the right to analyze and dispute these assertions/requirements in the future.

If the Examiner does not believe that all pending claims are now in condition for allowance, the Examiner is urged to contact the undersigned to expedite prosecution of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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